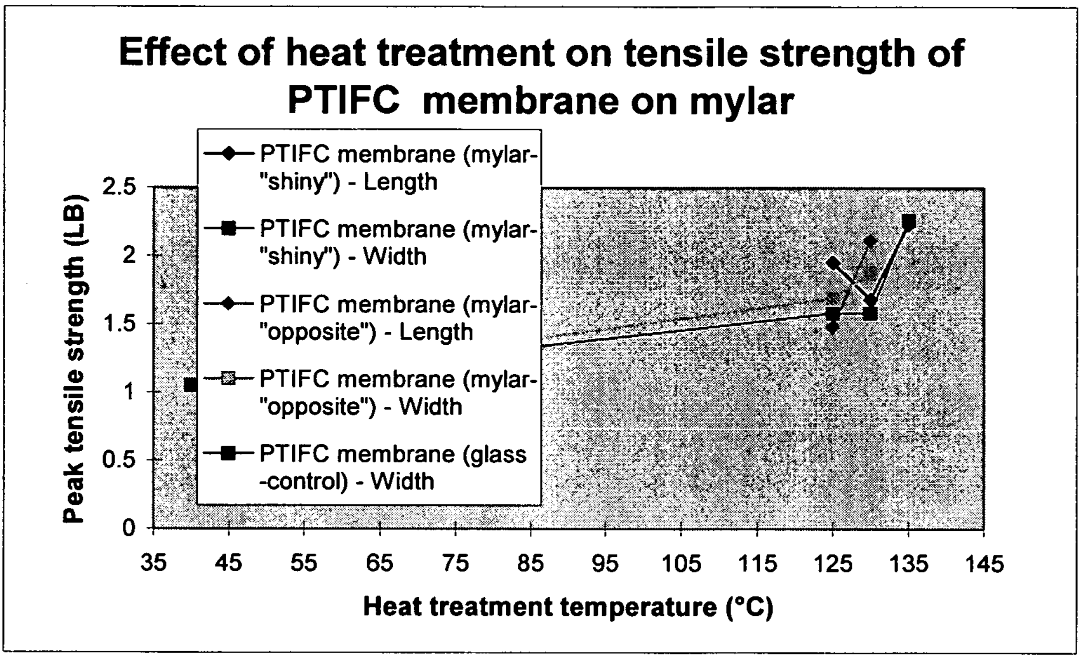

Effect of heat treatment on tensile strength of PTIFC membrane on mylar
PTIFC membrane (mylar-"shiny") - Length
PTIFC membrane (mylar-"shiny") - Width
PTIFC membrane (mylar-"opposite") - Length
PTIFC membrane (mylar-"opposite") - Width
PTIFC membrane (glass -control) - Width
Peak tensile strength (LB)
2.5
2
1.5
1
0.5
0
35
45
55
65
75
85
95
105
115
125
135
145
Heat treatment temperature (°C)

FIG. 1

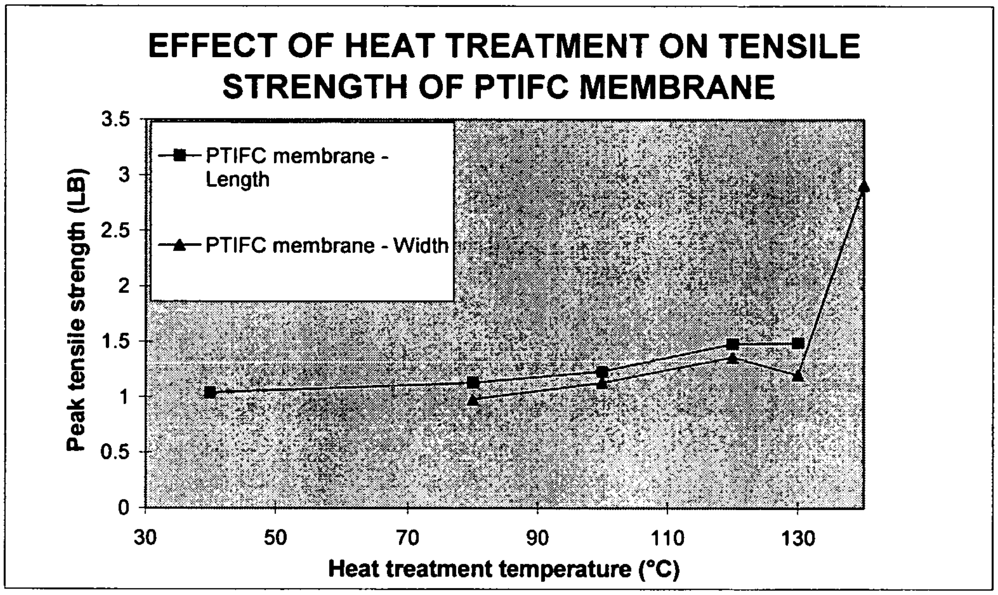

EFFECT OF HEAT TREATMENT ON TENSILE STRENGTH OF PTIFC MEMBRANE
PTIFC membrane - Length
PTIFC membrane - Width
Peak tensile strength (LB)
3.5
3
2.5
2
1.5
1
0.5
0
30
50
70
90
110
130
Heat treatment temperature (°C)

FIG. 1

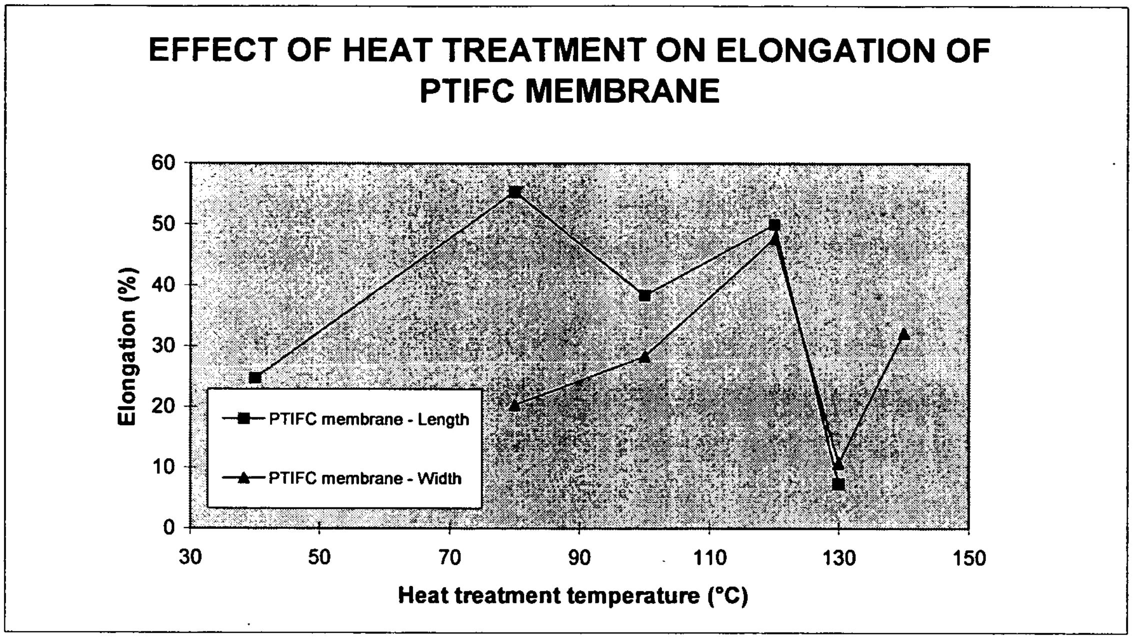

EFFECT OF HEAT TREATMENT ON ELONGATION OF PTIFC MEMBRANE
Elongation (%)
60
50
40
30
20
10
0
30
50
70
90
110
130
150
Heat treatment temperature (°C)
PTIFC membrane - Length
PTIFC membrane - Width

FIG. 2

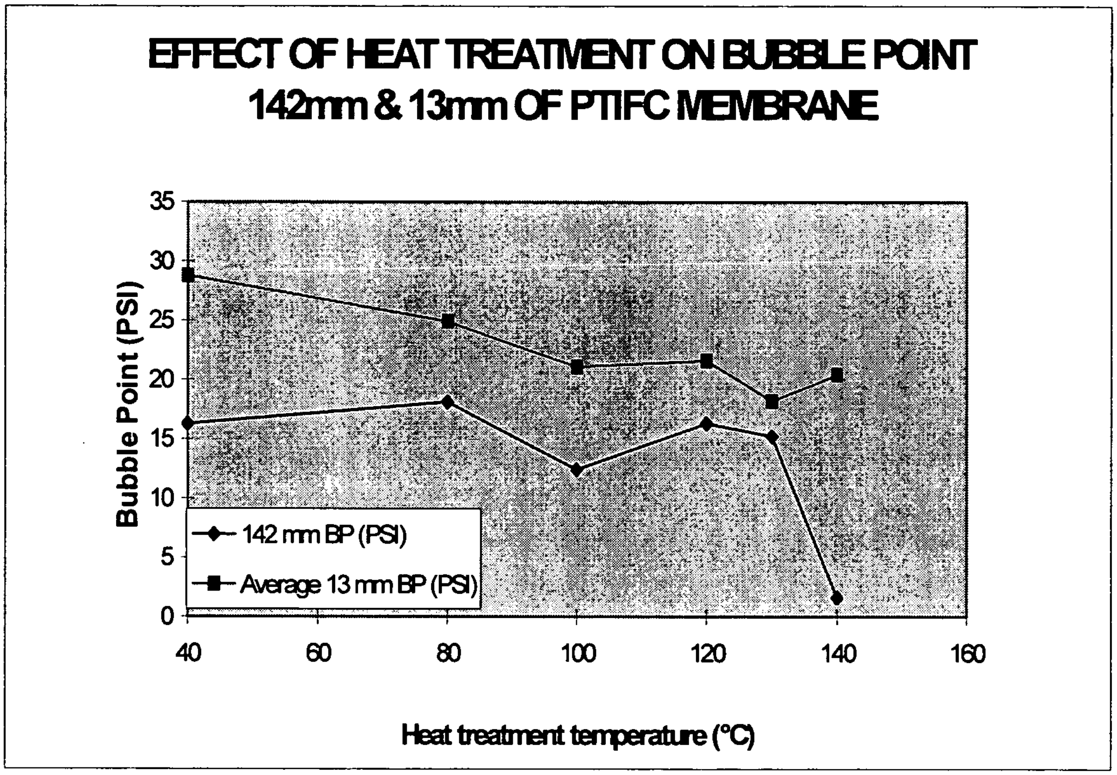

EFFECT OF HEAT TREATMENT ON BUBBLE POINT
142mm & 13mm OF PTIFC MEMBRANE
Bubble Point (PSI)
35
30
25
20
15
10
5
0
40
60
80
100
120
140
160
Heat treatment temperature (°C)
142 mm BP (PSI)
Average 13 mm BP (PSI)

FIG. 3

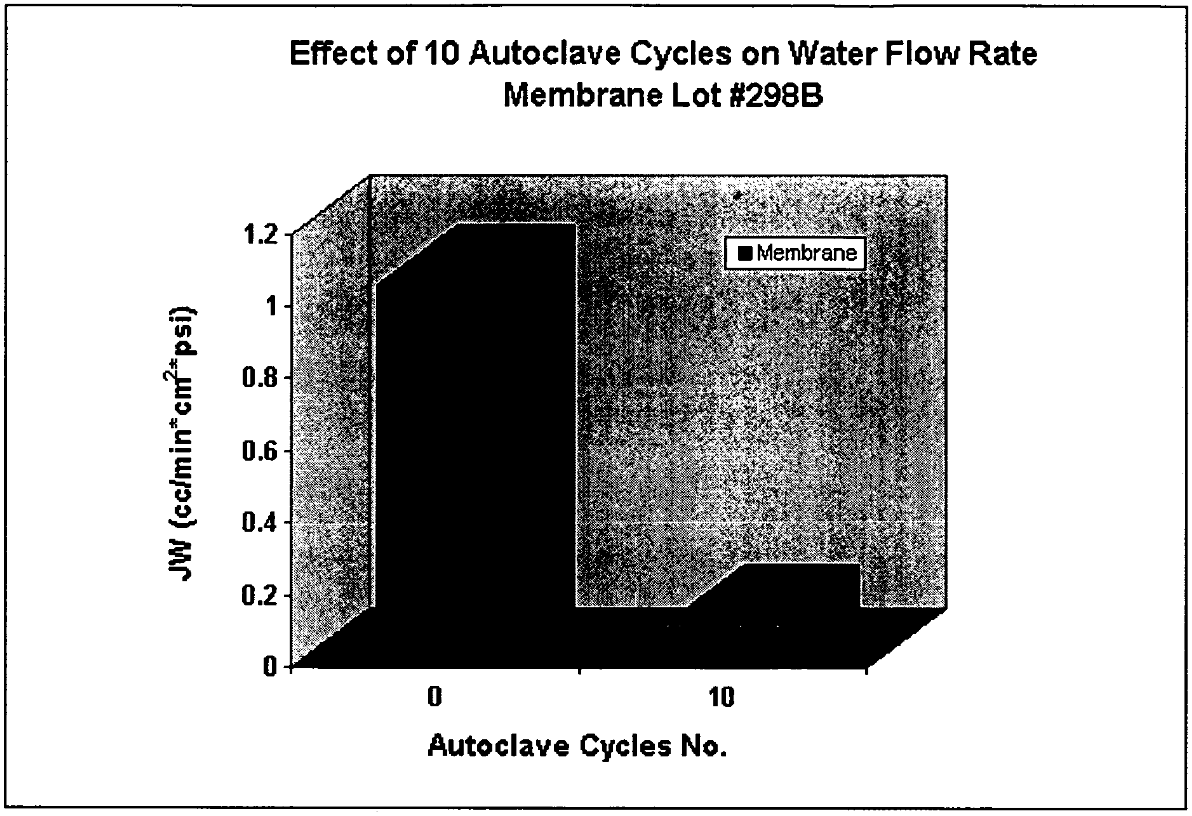

Effect of 10 Autoclave Cycles on Water Flow Rate
Membrane Lot #298B
JW (cc/min*cm^2*psi)
1.2
1
0.8
0.6
0.4
0.2
0
■ Membrane
0
10
Autoclave Cycles No.

FIG. 4

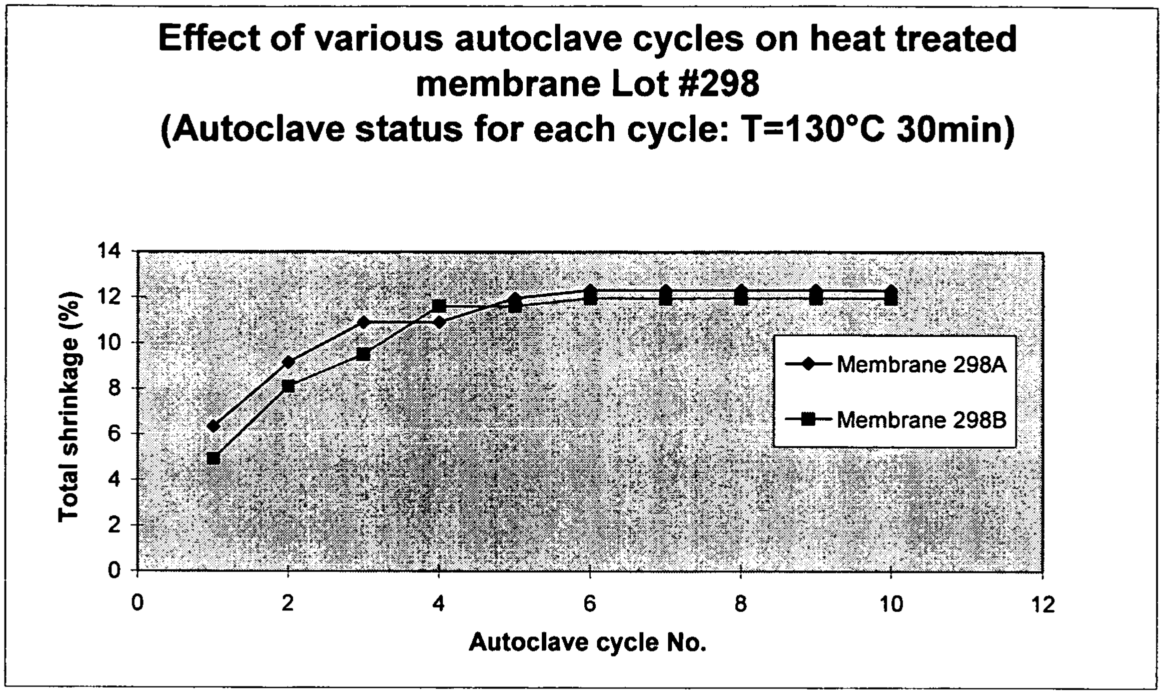

Effect of various autoclave cycles on heat treated membrane Lot #298
(Autoclave status for each cycle: T=130°C 30min)
Total shrinkage (%)
14
12
10
8
6
4
2
0
0
2
4
6
8
10
12
Autoclave cycle No.
Membrane 298A
Membrane 298B

FIG. 5

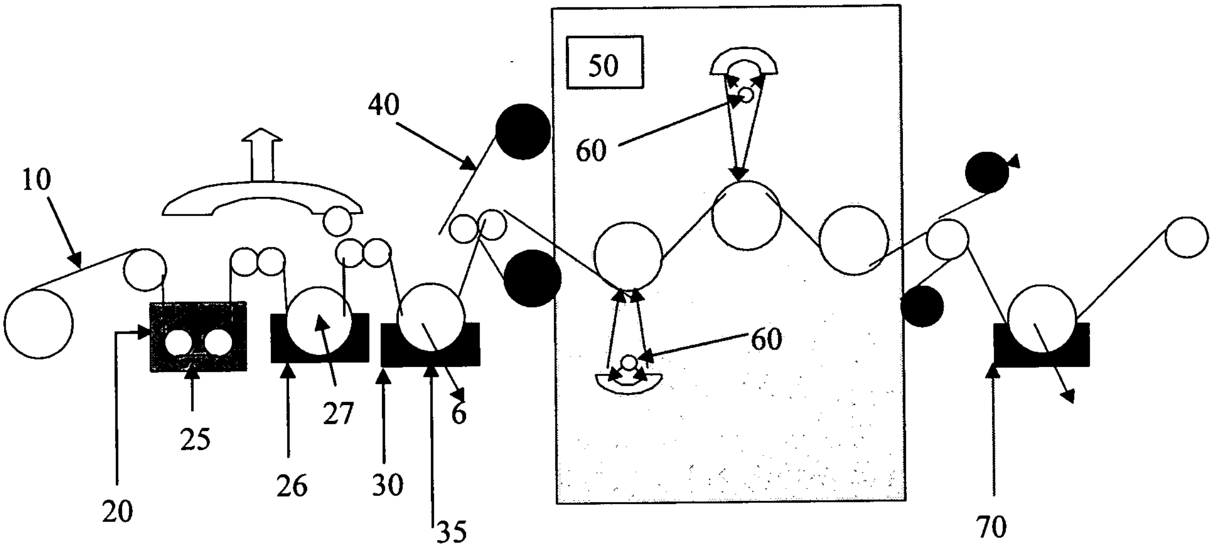


FIG. 6

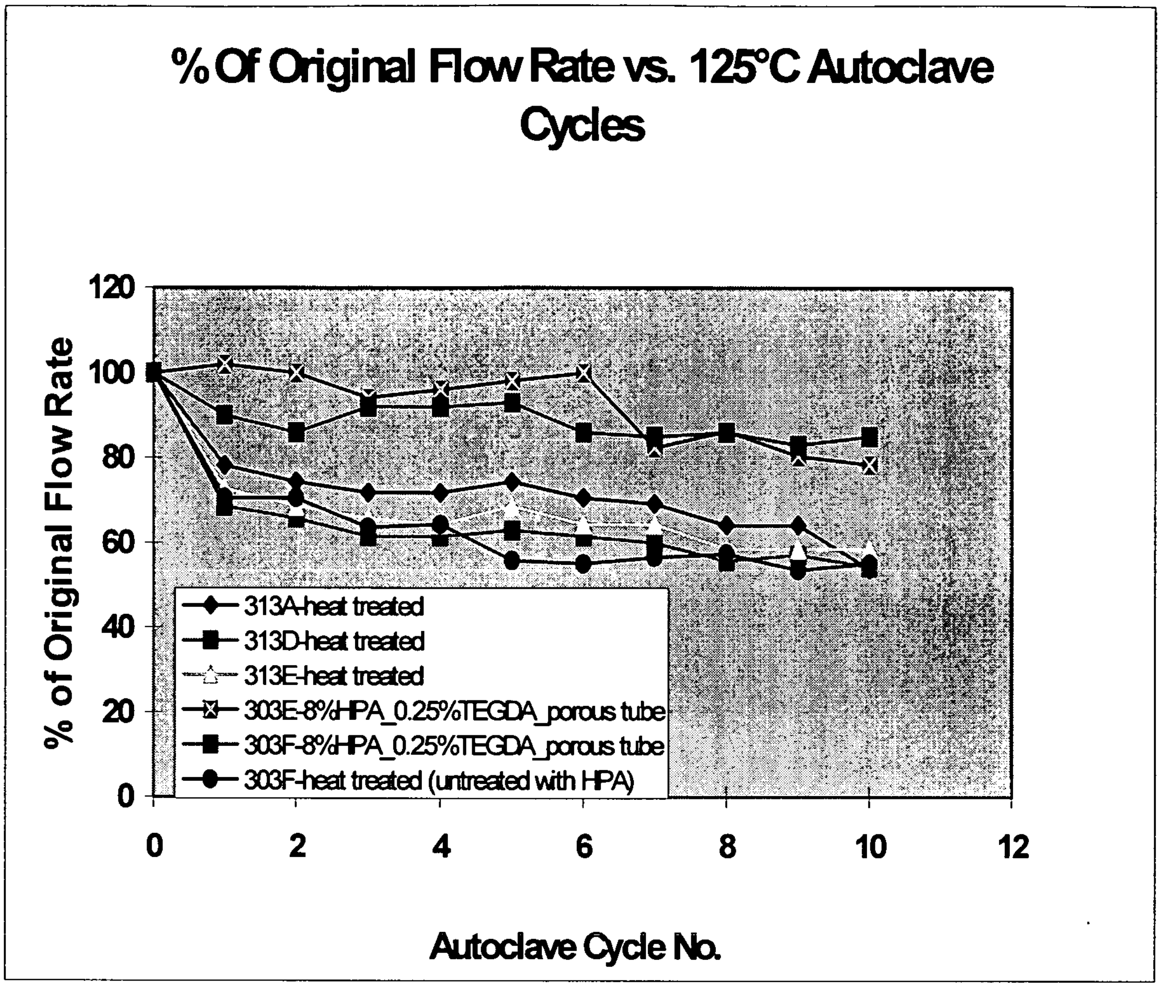
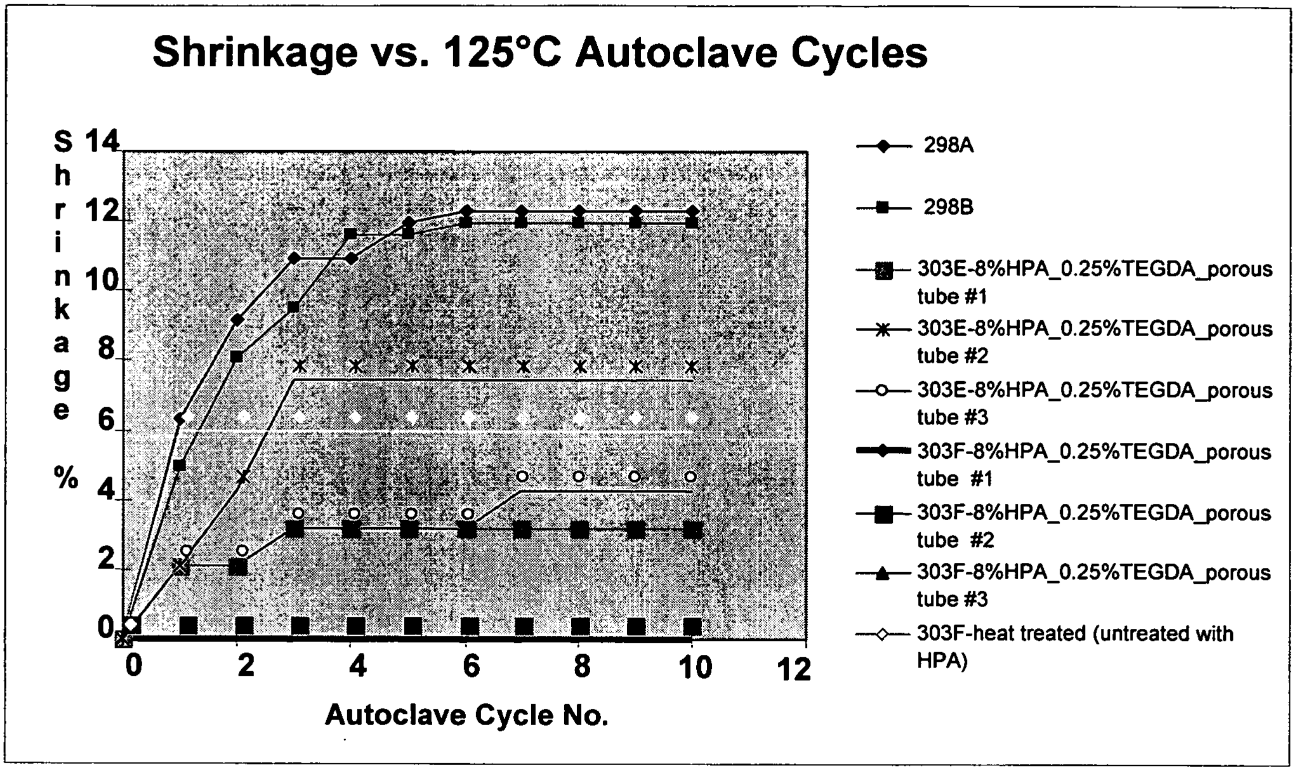

% Of Original Flow Rate vs. 125°C Autoclave Cycles
% of Original Flow Rate
120
100
80
60
40
20
0
0
2
4
6
8
10
12
Autoclave Cycle No.
313A-heat treated
313D-heat treated
313E-heat treated
303E-8%HPA_0.25%TEGDA_porous tube
303F-8%HPA_0.25%TEGDA_porous tube
303F-heat treated (untreated with HPA)

FIG. 7



Shrinkage vs. 125°C Autoclave Cycles
Shrinkage %
0
2
4
6
8
10
12
14
Autoclave Cycle No.
298A
298B
303E-8%HPA_0.25%TEGDA_porous tube #1
303E-8%HPA_0.25%TEGDA_porous tube #2
303E-8%HPA_0.25%TEGDA_porous tube #3
303F-8%HPA_0.25%TEGDA_porous tube #1
303F-8%HPA_0.25%TEGDA_porous tube #2
303F-8%HPA_0.25%TEGDA_porous tube #3
303F-heat treated (untreated with HPA)

FIG. 8

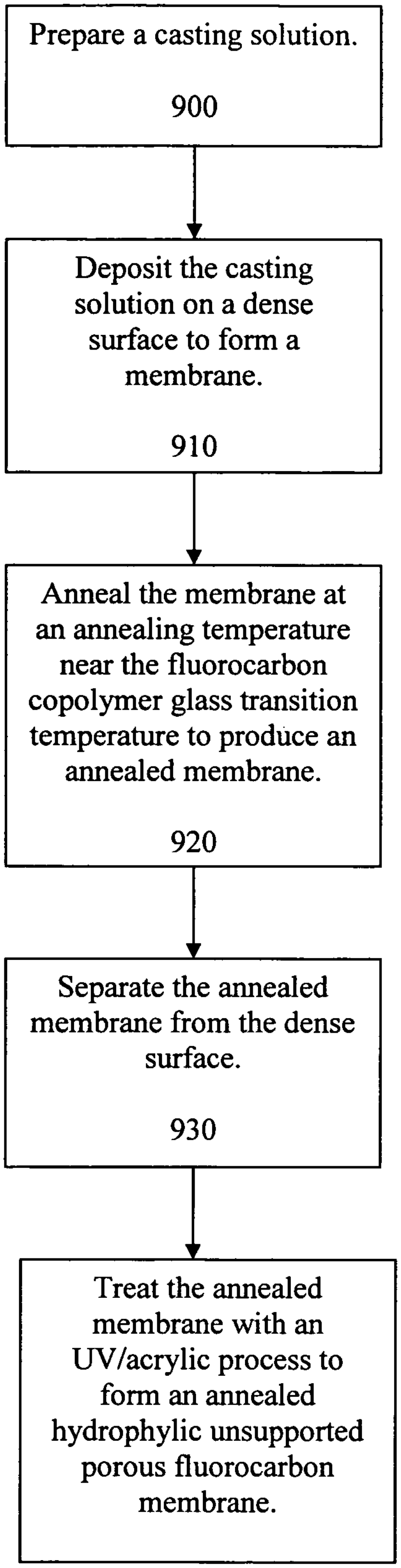

Prepare a casting solution.
900
Deposit the casting solution on a dense surface to form a membrane.
910
Anneal the membrane at an annealing temperature near the fluorocarbon copolymer glass transition temperature to produce an annealed membrane.
920
Separate the annealed membrane from the dense surface.
930
Treat the annealed membrane with an UV/acrylic process to form an annealed hydrophylic unsupported porous fluorocarbon membrane.

FIG. 9

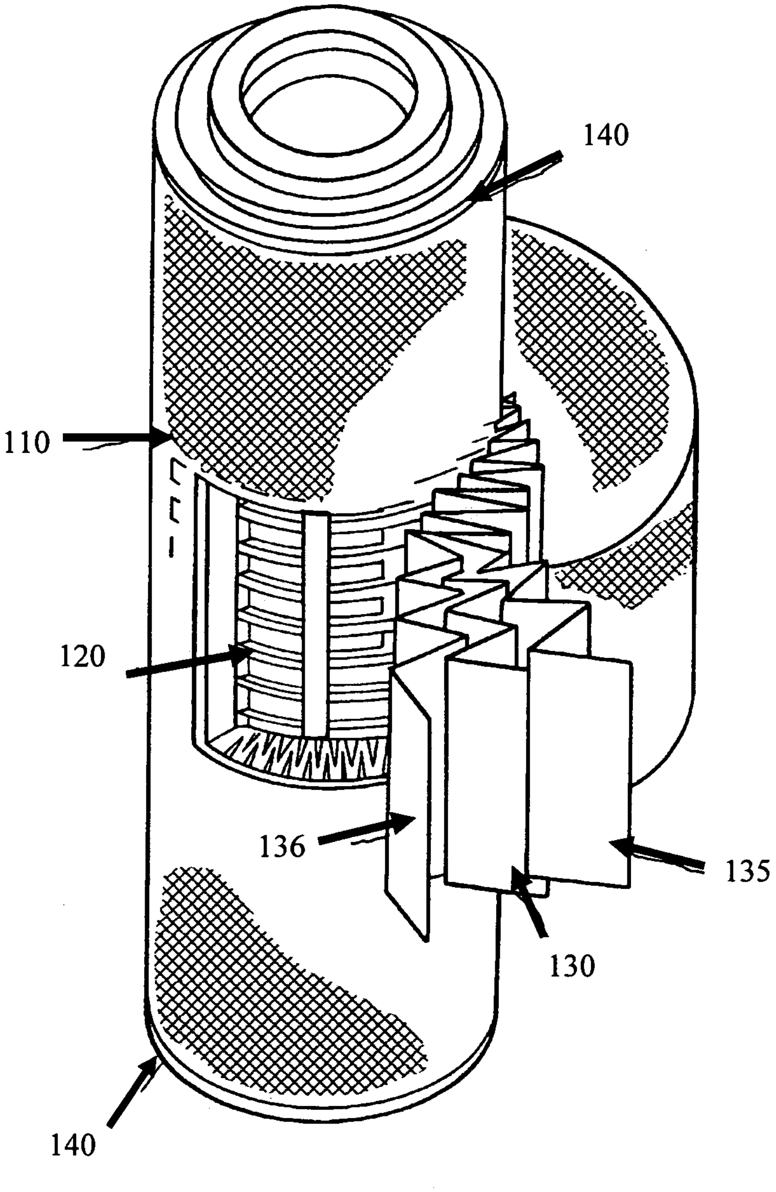


FIG. 10

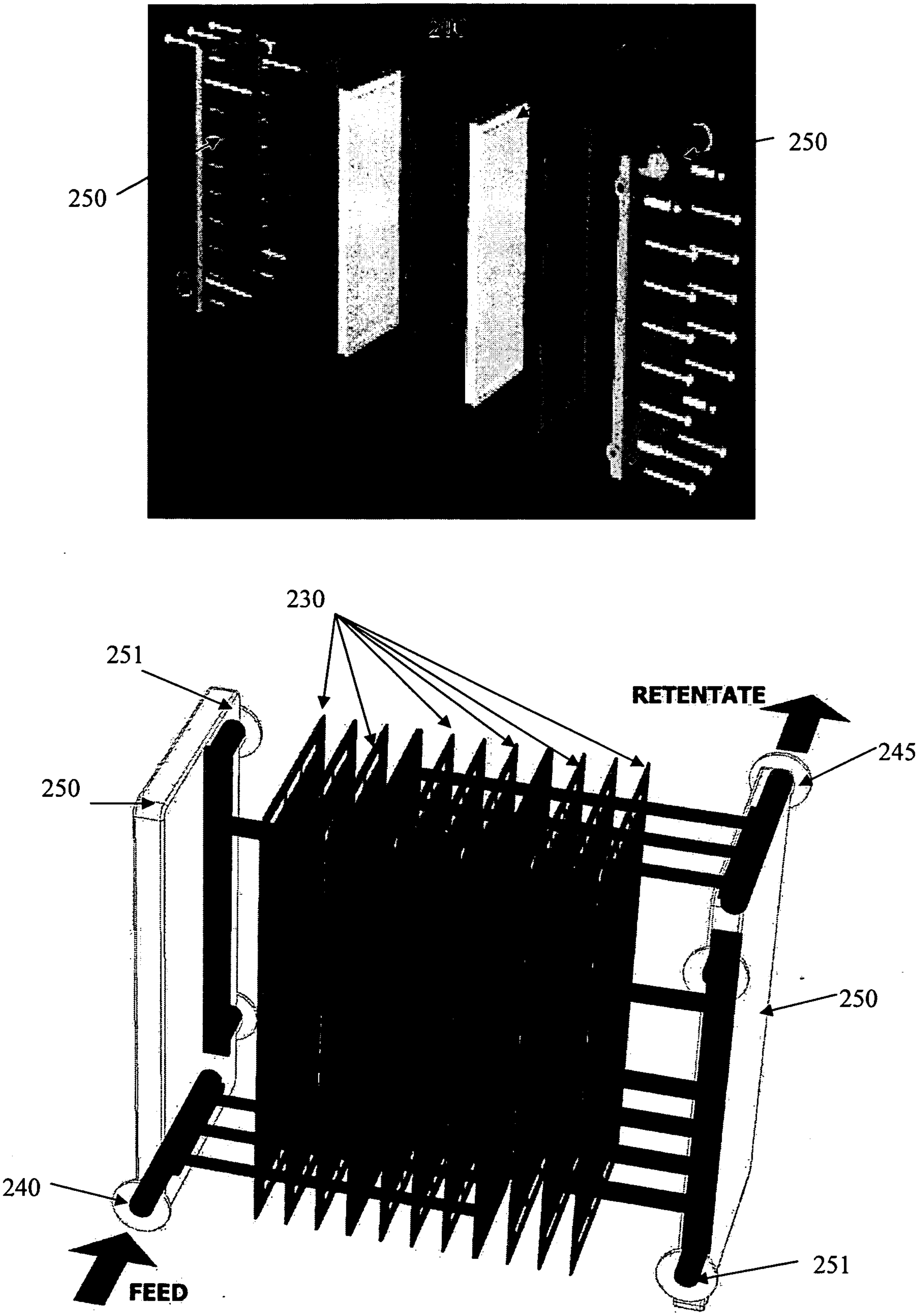


FIG. 11

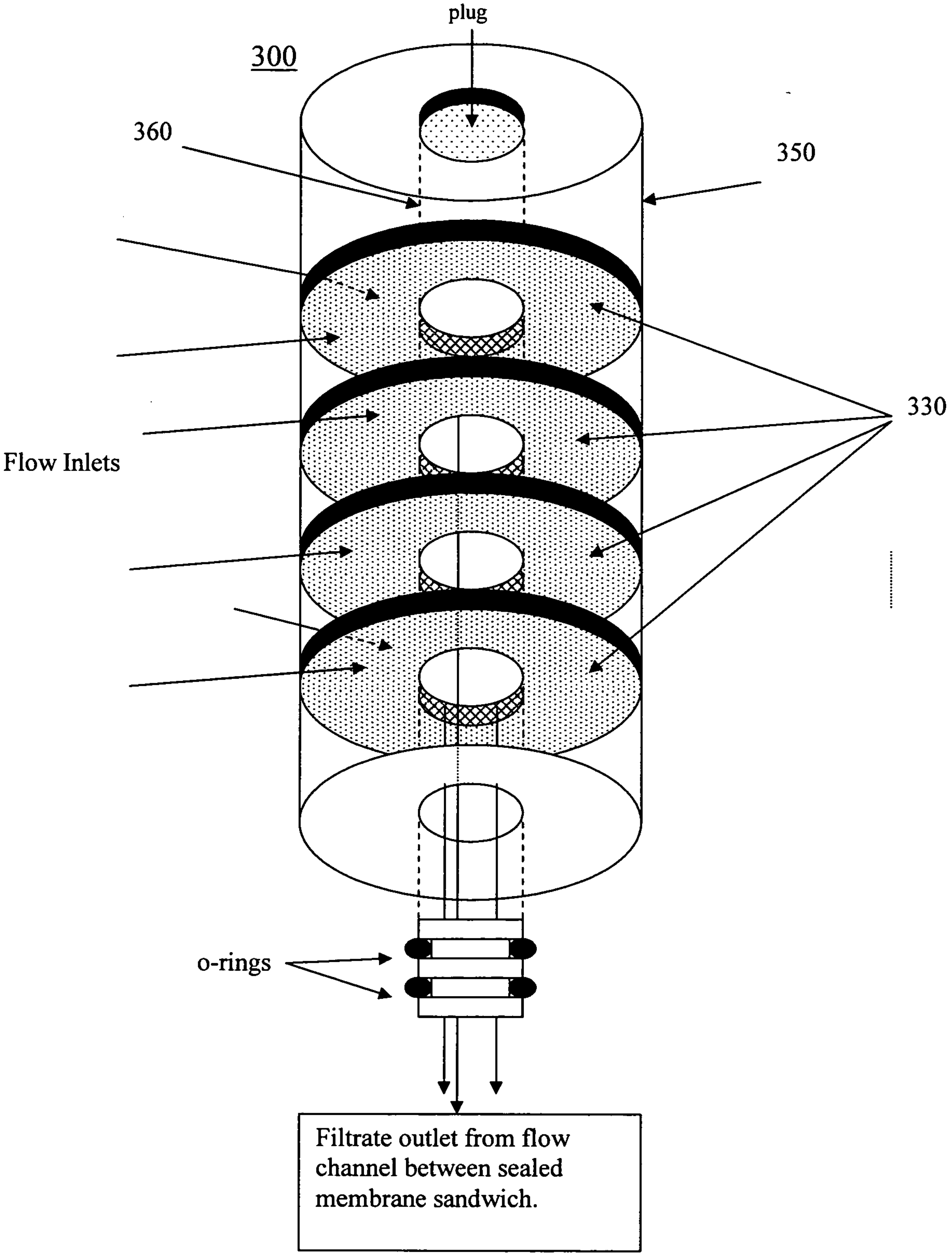

plug
300
360
350
330
Flow Inlets
o-rings
Filtrate outlet from flow channel between sealed membrane sandwich.

FIG. 12

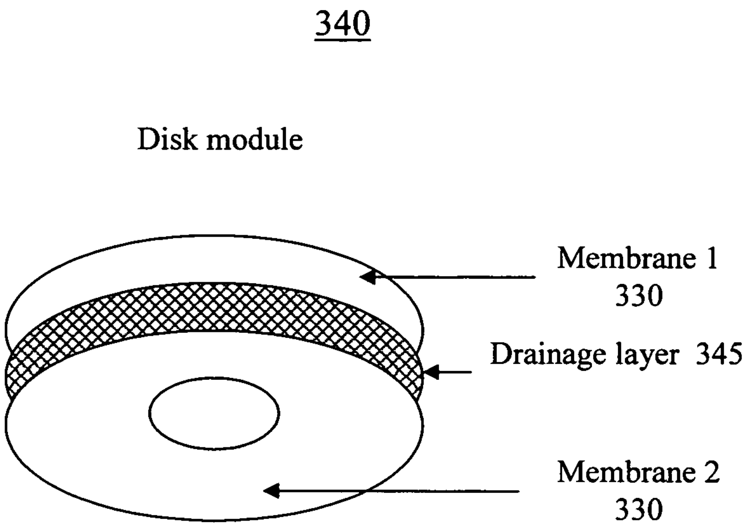

340
Disk module
Membrane 1
330
Drainage layer 345
Membrane 2
330

FIG. 13